

C l a i m s

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1. Method for determining a position (x_p) of a peak of a pulse in a signal received at a receiver, said method comprising:

taking samples of said received signal;

10 determining at least three samples, of which at least one has a signal strength exceeding a threshold value; and

determining the position (x_p) of said pulse peak based on an interpolation of at least two of said determined samples, which at least two samples are selected based on the signal strengths of said at least three determined samples, and which interpolation includes an evaluation of the signal strength of said at least two samples.

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2. Method according to claim 1, wherein different equations for said interpolation are provided for different distributions of the signal strengths of said at least three determined samples.

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3. Method according to claim 1, wherein said at least two samples are selected based in addition on a model for a pulse shape (31,41,51,61).

30 4. Method according to claim 1, wherein equations for said interpolation are determined based on a model for a pulse shape (31,41,51,61).

5. Method according to claim 3, wherein said model of said pulse shape (31,41,51,61) has a triangular shape.

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6. Method according to claim 5, wherein, in case a signal strength $A(x_0)$ of a determined sample at a first position x_0 is smaller than a signal strength $A(x_1)$ of a determined second sample at a following second position x_1 and the signal strength $A(x_1)$ of said second sample is larger than a signal strength $A(x_2)$ of a determined third sample at a following third position x_2 , the position of said peak is estimated to be:

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$$x_1 + \frac{1}{2} \left[\frac{A(x_2) - A(x_0)}{A(x_2) + A(x_0)} \right] \text{ chips.}$$

7. Method according to claim 5, wherein said pulse has a width of about two chips, wherein a sampling rate is two samples per chip, and wherein, in case a signal strength $A(x_0)$ of a determined sample at a first position x_0 is smaller than a signal strength $A(x_1)$ of a determined second sample at a following second position x_1 and the signal strength $A(x_1)$ of said second sample is smaller than a signal strength $A(x_2)$ of a determined third sample at a following third position x_2 , the position of said peak is estimated to be:

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$$x_0 + \frac{1}{2} \left[\frac{A(x_1)}{A(x_1) + A(x_0)} \right] \text{ chips.}$$

8. Method according to claim 5, wherein said pulse has a width of about two chips, wherein a sampling rate is two samples per chip, and wherein, in case a signal strength $A(x_0)$ of a determined sample at a first position x_0 is larger than a signal strength $A(x_1)$ of a determined second sample at a following second position x_1 , the position of said peak is estimated to be:

$$x_0 + \frac{1}{2} \left[\frac{A(x_1) - A(x_{-1})}{A(x_1) + A(x_{-1})} \right] \text{ chips},$$

10 wherein $A(x_{-1})$ is a signal strength of a determined third sample preceding said first sample at a third position x_{-1} .

9. Method according to claim 4, wherein a weighting of
15 the signal strengths of samples used in said interpolation is performed before said interpolation based on known deviations between said model of said pulse shape (61) and a real pulse shape (65).

20 10. Method according to claim 4, wherein a correction of a position (x_p) determined based on said interpolation is performed based on known deviations between said model of said pulse shape (61) and a real pulse shape (65) and based on the signal strengths of said samples.

25 11. Method according to claim 1, wherein said at least three samples are consecutive samples.

12. Device comprising means for determining the position (x_p) of a peak of a pulse in a signal received at a receiver according to claim 1.

5 13. Device according to claim 12, wherein said device is
said receiver.

10 14. Device according to claim 12, wherein said device is
a device external to said receiver and comprises
further means for receiving from said receiver
information on said received signal.

15 15. Device according to claim 14, wherein said device is
a network element of a cellular communication system.

15 16. Cellular communication system comprising a device
according to claim 1.